Patent Claims

1. A method for power matching in an electricity grid (N), the grid comprising two or more power generating plants (G1 ... G3) supplying power output into the grid, and two or more power loads (M1 ... M8) consuming power from the grid

and at least one storage plant (S), comprising at least one storage volume (100);

at least one power generating machine (T) for operation with an energy storage fluid which is stored in the storage volume, and which power generating machine is connected to a generator (GS) which supplies electrical power during operation;

at least one power consuming machine (V) for feeding energy storage fluid into the storage volume, the power consuming machine is connected to a motor (MS) which consumes electrical power during operation;

wherein, in a first operating state, the sum of the power output supplied by all the power generating plants and from the power generating machine equals the sum of the power which is consumed by all the power loads and by the power consuming machine, such that the grid is in equilibrium,

characterized in that the power consumption of the power consuming machine in the storage plant is controlled so as to maintain equilibrium between the power consumption and the power supply within the grid.

2. The method as claimed in one of the preceding claims, characterized in that the power matching is carried out in a first step in controlling the power consumption (P_) of the power consuming machines (V) in storage plants (S) and any frequency response capabilities which may be present, wherein the power output from the power generating machines (T) of storage plants and other power plants connected to the grid is maintained constant.

3. The method as claimed in one of the preceding claims, characterized in that the power consumption (P_) of the power consuming machine (V) is reduced when a power generating plant (G1 ... G3) is disconnected from the grid or when a load (M1 ... M8) is connected to the

grid.

4. The method as claimed in claim 3, characterized in that the drive motor (MS) for the power consuming machine (V) is completely disconnected from the grid.

5. The method as claimed in one of claims 3 or 4, characterized in that, in a further step, the power output from the power generating machine (T) in the storage plant and/or from at least one power generating plant (G1 ... G3) is increased while, at the same time, the power consumption of the power consuming machine (V) in the storage plant is increased, with the equilibrium between the power output and the power consumption in the grid being maintained.

6. The method as claimed in one of claims 1 or 2, characterized in that the power consumption (P_) of the power consuming machine (V) is increased when a load (M1 ... M8) is disconnected from the grid or is rapidly deloaded.

7. The method as claimed in claim 6, characterized in that, in a further step, the power output from the power generating machine (T) in the storage plant and/or at least one power generating plant (G1 ... G3) is increased, and the power consumption of the power consuming machine (V) in the storage plant is increased at the same time, with the equilibrium between the power output and the power consumption in the grid being maintained.

8. The method as claimed in one of the preceding claims, characterized in that, in order to maintain the maximum power dynamic response, all the power consuming machines (T) in at least one storage plant (S) are each operated at at least 80% of their maximum power consumption, and in that the generators of all the power generating machines (T) in said storage plant (S) are synchronized and connected to the grid, with the power generating machines each being operated at the minimum permissible power.

9. The method as claimed in claim 8, characterized in that the power generating

machines are operated at less than 20%, and preferably less than 10%, of their maximum power output.